

Remarks

Claims 1 through 21 are now pending.

Claim Amendments

Claim 1 has been amended to recite that the polyepoxide is a dispersed particulate polyepoxide. Support is found in the specification at Page 9, Line 4.

Claims 14 through 21 have been added to better define what Applicants regard as the invention. Support is found in the original claims and at Page 8, Lines 9 through 31.

Claim Objections

Rejections Under 35 U.S.C. Section 103

Claims 1 through 3 and 6 through 13 have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Kawabata (U.S. Patent No. 5,309,970 ; hereinafter "Kawabata") in view of Hergenrother (EP 0280906; hereinafter "Hergenrother"), Toyoda (U.S. Patent No. 4,963,613 ; hereinafter "Toyoda"), and Watanabe (WO 01/14461, hereinafter "Watanabe"). Claim 4 has been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Kawabata in view of Hergenrother, Toyoda, and Watanabe, and further in view of Marshall (U.S. Patent No. 3,940,544; hereinafter "Marshall"). Claim 5 has been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Kawabata in view of Hergenrother, Toyoda, and Watanabe, and further in view of Hayashi (U.S. Patent No. 5,162,437; hereinafter "Hayashi"). To the extent that the amended claims are deemed unpatentable over the cited art, these rejections are traversed.

Initially, Applicants note that the present invention, rather than being an obvious combination of the cited art, represents a patentable advancement over the prior art. In particular, as noted in the current specification as filed at Page 2, Lines 9 through 19:

State of the art runflat tires use rayon as carcass reinforcement. The use of PET polyester treated tire cords in runflat carcass applications has been evaluated in the past with poor results, particularly in runflat mileage, due to excessive heat build up. Such is the case not only for the tire carcass, but also the belts and other inserts of textile cords where the high temperatures are detrimental to the

adhesion between the cord and the rubber coat. In particular, the ability for PET polyester treated-cords to sustain an adequate interfacial bonding strength when subject to very high temperature is unsatisfactory. This poorer than desired bonding strength may occur between the adhesive/polyester surface or may peel off the polyester surface. In either case, the resultant appearance of the treated-cord is unsatisfactory, i.e. white, little presence of adhesive/elastomer along the surface.

Consistent with this summary of the prior art, it is noted that Kawabata teaches a runflat tire wherein the carcass plies may be made of rayon or polyester (Column 3, Lines 60 through 64); as noted by the Examiner, Kawabata is silent as to treating the reinforcing elements. And, further in keeping with the foregoing summary of the prior art, the Examiner notes that it is well known to treat polyester cord to facilitate bonding to rubber, as in Hergenrother. What is not known, and as will be shown by Applicants to be nonobvious over the cited art, is the runflat tire recited in the present claims.

Hergenrother teaches that the disclosed polyester fiber treatment must utilize a water soluble epoxy (abstract; Page 3, Lines 40 and 41). By contrast, amended claim 1 recites an aqueous emulsion of a dispersed particulate polyepoxide. As would be appreciated by one skilled in the art, a particulate polyepoxide dispersed in an aqueous medium is necessarily not a water soluble epoxy; if the polyepoxide particles were water soluble they would no longer exist as particles, but would rather dissolve in the water. As Hergenrother requires the use of a water soluble epoxy in the fiber treatment and leaves no room for variation from a water soluble epoxy, Applicants urge that the proposed combination of Kawabata and Hergenrother (with regard to the polyepoxide) does not result in the present claims. Moreover, as Hergenrother requires a water soluble epoxy, one skilled in the art would not be motivated to substitute a non-water soluble, dispersed particulate polyepoxide (such as may be taught by Marshall or Hayashi) for the water soluble epoxy treatment of Hergenrother to treat the carcass cords in the runflat tire of Kawabata. Clearly, a prima facie case of obviousness does not exist.

Applicants urge that new claims 14 and 15 are independently patentable over the cited art. Claims 14 and 15 recite alternatively that the polyester yarns are adhesive activated or

comprise a polyepoxide adhesion activator prior to twisting into the cord. Hergenrother in fact teaches an adhesive active finish (abstract) such as would be used in the limitations of claims 14 and 15. Nowhere does Hergenrother or any combination of the cited art teach nor make obvious runflat tire comprising a component having a polyester cord with adhesive activated yarns (as taught by Hergenrother) further treated with an aqueous emulsion comprising a dispersed particulate polyepoxide and an RFL after twisting the yarns into a cord. The proposed combination of Kawabata and Hergenrother and the other cited art thus fails to teach all of the limitations of claims 14 and 15.

Applicants further urge that even if prima facie obviousness exists, the present specification includes evidence of unexpected results sufficient to overcome prima facie obviousness of claims 14 and 15. Example 1 at Page 12, Line 31, to Page 14, Line 44, includes a comparison of an adhesive activated polyester cord treated according to the present invention (Sample 3) and a control using an adhesive activated polyester treated with RFL (Sample 4). The control Sample 4 thus represents the closest prior art, Hergenrother. Table 2 includes a comparison of samples cured for 32 minutes at 150°C, a typical tire cure cycle. For the adhesion test at 150°C, it is shown that the adhesion of Sample 3 to rubber is about 21 percent greater (92 N vs 76 N) than for control Sample 4. The test conditions at 150°C are representative of the temperature environment during a runflat deflation. Unexpectedly, the polyester cord treated in accordance with the present invention show better adhesion under runflat conditions than does the prior art adhesive activated cord according to Hergenrother. Applicants urge that this showing of unexpected results is sufficient to overcome prima facie obviousness of claims 14 and 15.

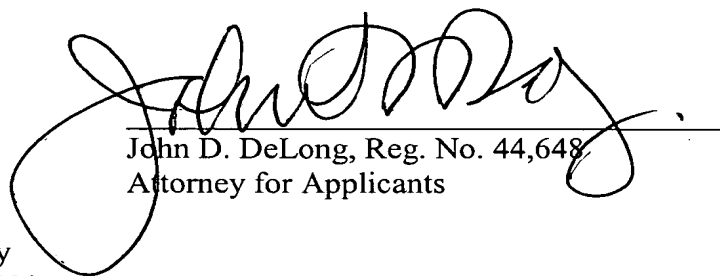
Applicants urge that new claims 16 through 21 are independently patentable over the cited art. With regard to claims 16, 18, and 20, Kawabata teaches only that an auxiliary belt layer 33 may be made from nylon and teaches nothing about a fiber treatment (column 4, lines 9-18). By contrast, the runflat tire of the present invention includes an overlay made from

polyester and treated as recited in the claims. Moreover, Kawabata teaches nothing regarding an underlay. Further, the present specification includes evidence of unexpected results sufficient to support the patentability of claims 16 through 21. Example 2 shows a performance comparison for a runflat tire made with PET polyester overlay and underlay treated according to the present invention (EXP 1) compared to a prior art tire made with nylon overlay and rayon underlay (control). The tire had identical carcass construction. Unexpectedly, the experimental tire show essentially equivalent performance to the prior art tire in lab run flat endurance (458 km vs 454 km). Example 3 shows a performance comparison for a runflat tire made with PET polyester carcass treated according to the present invention (EXP 2) compared to a prior art tire made with a rayon carcass. The tires had identical overlay and underlay construction. Unexpectedly, the experimental tire showed essentially equivalent performance to the prior art tire in lab run flat endurance (410 v 454 km). As noted earlier herein in the prior art summary, previous experience with polyester carcass, overlay and underlay has been unacceptable compared with rayon.

Conclusion

Applicants urge that the amended claims are now fully patentable over the cited art. Applicants respectfully request allowance of all claims.

Respectfully submitted,



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